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Adolescent Loneliness, Self-Disclosure, and Private Self-Consciousness: A Longitudinal Investigation

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Recent years have seen a burgeoning interest in the psychological state of loneliness, which is conceived of as the subjective experience of remoteness and social isolation. Loneliness has come to be recognized as a

pervasive phenomenon in contemporary U.S. society (e.g., Bradburn, 1969; Rubenstein, Shaver, & Peplau, 1979; Slater, 1970; Weiss, 1973), and lately research has identified a host of negative correlates of loneliness, including feelings of anxiety, depression, and alienation (e.g., Horowitz & French, 1979; Jones, Freemon, & Goswick, 1981; Russell, Peplau, & Cutrona, 1980; Russell, Peplau, & Ferguson, 1978). Attempts to identify the causes of loneliness have recently led to at least one conclusion that seems to be widely shared by investigators in the field: The experience of loneliness is at least as much a function of the quality (e.g., intimacy, privacy) of one's social intercourse as the sheer quantity of the time spent with others.

In particular, one qualitative feature of social relationships—the intimacy of self-disclosure to others—has attracted research attention. Several investigations (e.g., Berg & Peplau, 1982; Chelune, Sultan, & Williams, 1980; Solano, Batten, & Parish, 1982) using college student populations have discovered significant associations between disclosure to others and subjective feelings of loneliness. In each case, a greater intimacy in disclosure and/or a greater willingness to disclose was associated with less loneliness. Typically this association was stronger for women than men, and in some cases no relation at all was evident for men. It should also be noted that the strongest evidence for a self-disclosure-loneliness link in these investigations involved disclosure to peers and not to parents.

Given this disclosure-loneliness link, one natural question becomes “What factors predispose someone to engage in intimate self-disclosure?” Actually, another focus of recent research has been on locating the antecedents of self-disclosure. In particular, attention has been given to the personality characteristics that may foster or inhibit intimate disclosure about oneself to others. This research has generally been less fruitful; one review of more than 20 years of such work concluded that a “hazy, confused portrait is all that can be distilled from two decades of investigation” (Archer, 1979).

Personality, Disclosure, and Loneliness: A Model

Recently we made an attempt to incorporate personality factors, self-disclosure, and reported loneliness within a single theoretical model. We tested this model using a sample of adolescents from the United States (Franzoi & Davis, 1985). A graphic representation of this model appears in Figure 1. The endpoint of the model is the subjective state of loneliness. The variables in the model that immediately precede loneliness are self-disclosure to mother, father, and peers. On the basis of previous research (Goswick & Jones, 1982; Solano et al., 1982), it was anticipated that disclosure to parents would be unrelated to loneliness but that self-disclosure to peers would be significantly and negatively related. Preceding each of the self-disclosure variables in the model are two antecedent factors thought to be especially important in affecting disclosure to that target. The two personality factors preceding the peer-disclosure variables are private self-consciousness and perspective taking.

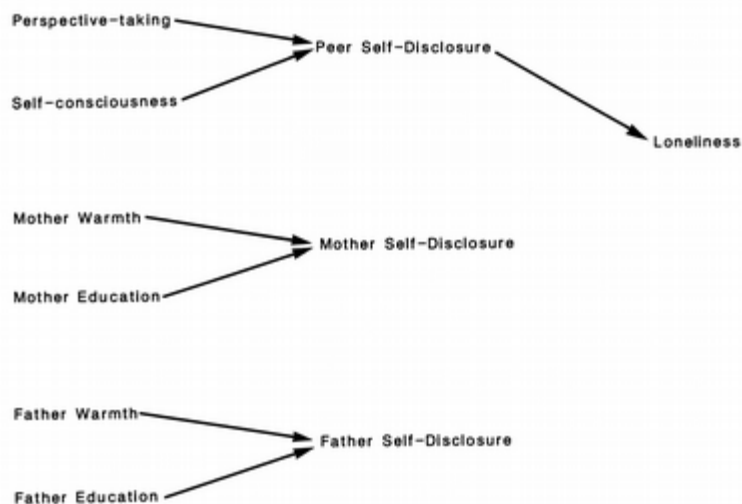


Figure 1. Original model linking loneliness, self-disclosure, and antecedent factors

Private self-consciousness is the dispositional tendency to focus attention on the more private and covert aspects of the self. On the basis of the evidence that those high in this disposition possess clearer, more distinct self-knowledge (e.g., Bernstein & Davis, 1982; Franzoi, 1983; Scheier, Buss, & Buss, 1978; Turner, 1978), we predicted that such persons would be better equipped to self-disclose information than those low on the private self-consciousness trait and that those high on private self-consciousness would possess the wealth of self-knowledge that typically is the material for intimate self-disclosure to peers. In addition to high self-conscious persons being better-equipped, we hypothesized that their tendency to attend to private thoughts and feelings may indicate a greater willingness to engage in activities in which personal feelings will be felt and expressed. In a sense, this hypothesis was based on the belief that self-disclosure would provide a bridge between one's private world and one's public world, thus resulting in a person feeling less socially isolated.

The second personality variable, perspective taking, represents an individual's tendency to entertain the psychological point of view of another person (Davis, 1980, 1983). Someone willing and able to see things from the "other guy's" point of view should be better able to anticipate others' feelings, needs, and behavior and, thus, minimize interpersonal friction. Davis (1983) reported associations between a measure of perspective taking and measures of social competence that support this view. There is also evidence (Miller, Berg, & Archer, 1983) that higher perspective-taking scores are significantly associated with a characteristic (high scores on the Openers Scale) that predicts that one will be the recipient of intimate self-disclosure. This makes sense because the considerate social style of perspective takers probably invites disclosure. Given the *norm of reciprocity* in self-disclosure (the fact that when one member of a dyad self-discloses, the other is likely to respond in kind) it was predicted that perspective taking, like private self-consciousness, would be associated with more intimate self-disclosure with one's peers.

The other antecedent variables in Figure 1 were of less theoretical interest, but they were expected to substantially affect disclosure toward mother and father. For reasons explained in the original study (Franzoi & Davis, 1985), both parental warmth and education were expected to foster greater disclosure to that parent.

This model, tested by means of structural equation techniques, was generally well supported. As expected, greater disclosure to peers was significantly and negatively associated with loneliness, and greater private self-consciousness was associated with higher levels of peer disclosure. The relation between perspective taking and

disclosure, although in the predicted direction, was not statistically significant. Of equal importance is that the overall fit of this theoretical model to the observed covariance matrix of the measured variables was good.

On the basis of previous research and our own theoretical assumptions, we had expected the path from peer disclosure to loneliness to be stronger for female than male subjects (owing to the greater importance in the culture for female subjects to engage in intimate disclosure). We also anticipated that the paths from the personality variables to peer disclosure would be weaker for female than for male subjects (owing, again, to the greater social pressure for female subjects to have such intimate social intercourse). Although there were some weak indications that such differences did exist, an alternative model incorporating these features produced no better statistical fit than did the baseline model that assumed no sex differences at all. We were thus left with the tentative conclusion that the relations among the variables were essentially the same for male and female adolescents.

One other alternative model was tested. On the basis of a diagnostic tool (the Modification Index [MI]) provided with the LISREL-VI statistical program that we used, a possible alteration in our baseline model was suggested. According to the MI, the baseline model would probably be improved if a direct path were estimated for male subjects between mother's warmth and loneliness. Accordingly, we tested one final model in which a direct path from mother's warmth to loneliness was estimated for male subjects. The fit of this model was significantly better than that of the baseline model, thus indicating that a model allowing for such a path is a better description of the actual relations in this sample.

Alternative Interpretations

The original investigation thus provided some evidence that the relations among the personality, self-disclosure, and loneliness variables were largely as we had expected. At the same time, however, this project had one major limitation; namely, because of its nonexperimental nature, some questions concerning direction of causality were not definitively addressed. Instead, some assumptions concerning causal direction were made in the original structural equation analyses. For instance, it was assumed that private self-consciousness and perspective taking lead to greater self-disclosure, and it was assumed that intimate self-disclosure leads to reduced loneliness. However, alternative interpretations of those assumptions are possible. In particular, there are two alternative explanations that deserve attention.

First, in contrast to the assumption that private self-consciousness causes greater self-disclosure, it is possible that self-disclosure causes heightened private self-consciousness. That is, regularly engaging, for whatever reason, in the disclosure of intimate details concerning oneself may help produce in the individual an enduring attention to private, nonvisible aspects of the self. Stated another way, persons who seldom if ever disclose to others personal feelings, fears, or aspirations may never develop the self-examining style characteristic of those high in private self-consciousness.

Second, in contrast to the assumption that greater self-disclosure causes reduced loneliness, it may be that heightened loneliness causes reduced self-disclosure. That is, persons who are characterized by feelings of remoteness and isolation from others may as a result disclose less to others. This may occur because lonely people actually have less social contact with others and thus less opportunity to disclose, or because feelings of loneliness simply reduce in some fashion the desire or willingness to disclose. In any event, it is possible that the causal direction that has been assumed thus far may in actuality be reversed.

Testing Causal Direction

How can such questions be addressed? There are two possible approaches that can be taken in survey research, each with its own advantages and disadvantages. The first approach is simply to make a different set of assumptions in testing the model and compare the fit of the new model with that of the original model. A better

fit would indicate that the alternative causal assumptions were better able to reproduce the observed relations among variables. This approach is particularly appropriate if the causal influence of one variable on another is thought to be instantaneous, or nearly so. The chief disadvantage of this approach is that it simply substitutes one set of assumptions for another; as long as all the variables are assessed contemporaneously, there is no way to know for certain that one variable definitely is or is not the cause of another.

The second major approach helps overcome this shortcoming by using a longitudinal design in which the relevant variables are measured at two or more points in time. The chief advantage of this strategy is that it can be safely assumed that any association between variables measured at different times does not reflect a causal path from the later-measured variable to the earlier-measured variable. The disadvantage of the longitudinal strategy has to do with the issue of lag times; that is, the length of time elapsing between one measurement point and the next. If the causal effect of one variable on another is very fast, a longitudinal design using long time lags may be inappropriate. Conversely, if the causal effect between variables occurs over a very long time and the measurement lag is short, the longitudinal design may also reveal nothing.

Because there are advantages to each approach, we chose to use both approaches in an attempt to evaluate most effectively the alternative explanations outlined earlier. The present article describes these attempts. Approximately one year after the initial Franzoi and Davis (1985) data were collected, questionnaires assessing the same variables were again administered to many of the same respondents. Thus, the measurement lag in the subsequent longitudinal analyses was one year—a considerable period of time. This design allowed us to again test the theoretical model that received the most support in the original study. Although that model received good support from the initial structural equation analyses, a finding that it remained viable one year later would considerably strengthen our confidence in its stability. This design also allowed us to test models in which alternative causal paths were estimated within the same measurement points, implicitly assuming that the causal lag between variables was instantaneous (or nearly so). Finally, the longitudinal design allowed us to evaluate models that included alternative causal paths between years instead of within years. Thus, this class of models rested on assumption that a somewhat longer causal lag exists between variables.

Method

Sample

In the first year of the investigation (reported in Franzoi & Davis, 1985), participants were 442 high school students (226 male and 216 female) from a small city (population approximately 8,000) located in Michigan's upper peninsula. A number of students were not included in the analyses because they failed to answer all relevant questions; so the final subject pool for the analyses consisted of 177 male and 173 female adolescents.

Approximately one year after the first data collection took place, we returned to the high school. Participants for the second year were 406 high school students (207 male and 199 female). Parental permission was obtained for all students who were administered the survey. As in the previous study, a number of students were eliminated owing to a failure to answer all relevant questions. The final subject pool consisted of 171 male and 161 female adolescents. Questionnaires were completed by the students in the classroom during the normal 55-min class periods.

Questionnaire

As in the first year of the investigation, each student completed a survey booklet. In this booklet, students were asked to provide biographical information concerning their age, sex, grade in school, and parents' educational background (i.e., less than high school degree; high school graduate; some college, but no degree; college graduate; graduate, medical, law school). As a measure of perceived parental warmth, students were asked to evaluate, using separate 5-point Likert scales (*warm, loving* to *hostile, rejecting*), their current relationship with both their mother and father. In addition, the questionnaire contained a number of items not relevant to the present investigation.

The two personality variables of interest were private self-consciousness and perspective-taking tendencies. Private self-consciousness was measured by the 10-item Private Self-Consciousness subscale of the Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975), and perspective taking was measured by the 7-item Perspective-Taking (PT) subscale of the Interpersonal Reactivity Index (IRI, Davis, 1980). The Private Self-Consciousness subscale has been widely used in recent years, and greater self-consciousness has been linked to a number of theoretically relevant constructs, such as more detailed self-knowledge (Franzoi, 1983; Turner, 1978) and greater correspondence between self-report and behavior (e.g., Scheier et al., 1978). The PT subscale was developed more recently and constitutes one portion of a multidimensional measure of empathy (the IRI). Davis (1980), in describing the development of this measure, reported that the PT subscale has adequate internal reliability ($\alpha = .75$ for men and $.78$ for women), with recent investigations providing evidence of its validity (Bernstein & Davis, 1982; Davis, 1983). The available evidence thus supported the view that the PT subscale indeed reliably measured individuals' tendency to spontaneously adopt the psychological point of view of others.

Assessment of disclosure to mother and father was made in a manner identical to that used in the first year. Four items from the Self-Disclosure Index (SDI; Miller et al., 1983) were used: "What is important to me in life" "What I like and dislike about myself," "My worst fears," and "Things I have done which I feel guilty about." Using a 5-point scale that ranged from *discuss not at all* to *discuss fully and completely*, subjects indicated the extent of their current disclosure separately to mother and father for each of the four topics. Disclosure to peers was assessed slightly differently in the second year. In the first year students simply responded to the four topics for the target *friends* in the same way that they had responded to the targets *mother* and *father*. In the second year *friends* was split into two targets: *same-sex friends* and *opposite sex friends*. Students responded to the four topics separately for each friend target. This change was made in order to allow a more revealing analysis of the disclosure patterns among adolescents; however, for present purposes it was essential to make the peer disclosure measures as comparable as possible from Year 1 to Year 2. For that reason, the Year 2 peer-disclosure measure, which was used in the present analyses, was a combination of the same-sex and opposite sex measures. Responses with regard to these two targets were averaged together to produce a disclosure index that, it was hoped, captured the same level of generality of response as the Year 1 question.

Degree of loneliness was assessed by using the four-item short version of the UCLA Loneliness Scale (Russell et al., 1980), which consists of two positively worded items ("I feel in tune with the people around me" and "I can find companionship when I want it") and two negatively worded items ("No one really knows me well" and "People are around me but not with me"). Russell et al. (1980) recommended this shortened version of the UCLA Loneliness Scale for survey research. Using optimal subset regression techniques, they selected four items

from the larger scale (Russell et al., 1978) that best predicted scores on the loneliness self-labeling index. This four-item loneliness scale had a coefficient alpha of .75 in their study.

Model Estimation

The models in this investigation were estimated using LISREL-VI (Jöreskog & Sörbom, 1981), a technique that yields maximum likelihood estimates and a chi-square goodness of fit test that allows an evaluation of the fit between the covariance matrix implied by a model and that which is actually observed. Thus, unlike values of the test statistic used to reject a null hypothesis, the *smaller* the chi-square relative to its degrees of freedom the better the fit. In addition, with LISREL-VI it is possible to compare the adequacy of two models by determining the significance of the difference in chi-square, provided that one model is nested; that is, is a special case of the other.

Results

Sex Differences

The means, standard deviations, and correlations among the variables are shown separately for male and female students in Table 1. Individual *t* tests revealed that male and female respondents differed significantly with respect to several of the variables in the model. For the personality measures, female respondents exhibited higher scores on perspective taking, $t(330) = -3.04, p < .005$, but not on private self-consciousness, $t(330) = -.38, ns$. No differences were found for the reported warmth of either father or mother ($ts < .40$). Male respondents reported slightly higher educational levels than did female respondents for fathers', $t(330) = 2.14, p < .05$, but not for mothers' education, $t(330) = 1.22, ns$. As it was unlikely that such a difference actually existed between the fathers of the male and female students, we suspected that the difference was a result of exaggeration by some male respondents. In any event, the differences were small and irrelevant to the more important questions regarding relations among variables. Finally, male students reported feeling more lonely than did female students, $t(330) = 2.00, p < .05$.

Table 1
Means, Standard Deviations, and Correlations of Variables

Variable	1	2	3	4	5	6	7	8	9	10	<i>M</i>	<i>SD</i>
Female adolescents ^a												
1. Loneliness	—	-.34**	-.20**	-.31**	-.03	.06	-.28**	-.15*	-.27**	-.15*	1.81	0.43
2. Peer self-disclosure		—	.30**	.27**	.04	.19**	.10	.15*	.12	.01	3.57	0.88
3. Mother self-disclosure			—	.51**	.01	.08	.50**	.08	.21**	.14*	3.24	1.10
4. Father self-disclosure				—	.04	-.10	.20**	.17*	.57**	.13	2.57	1.05
5. Perspective taking					—	.10	.02	.02	.03	.350	0.66	
6. Private self-consciousness						—	.03	.12	-.09	.15*	3.56	0.51
7. Mother warmth							—	.01	.18*	.11	4.32	0.86
8. Mother education								—	.04	.36**	2.61	1.07
9. Father warmth									—	.06	3.87	1.15
10. Father education										—	2.67	1.13
Male adolescents ^b												
1. Loneliness	—	-.15*	-.18*	-.32**	-.07	.24**	-.29**	-.03	-.37**	-.12	1.94	0.48
2. Peer self-disclosure		—	.35**	.26**	.21**	.23**	.05	-.13*	.01	.13*	2.95	0.95
3. Mother self-disclosure			—	.59**	.22**	.05	.41**	.03	.21**	.13*	2.77	1.03
4. Father self-disclosure				—	.20**	-.08	.28**	-.10	.47**	.11	2.71	0.98
5. Perspective taking					—	.22**	.10	.01	-.01	-.05	3.27	0.70
6. Private self-consciousness						—	.03	-.03	-.09	.06	3.54	0.55
7. Mother warmth							—	.02	.48**	.06	4.28	0.84
8. Mother education								—	-.04	.40**	2.74	1.07
9. Father warmth									—	.12	3.87	0.95
10. Father education										—	2.98	1.14

Note. All variables that consisted of responses to multiple items were divided by the number of items to produce an average item score.

^a *N* = 161.

^b *N* = 173.

* *p* ≤ .05.

** *p* ≤ .01.

Means, Standard Deviations, and Correlations of Variables

With regard to the disclosure indexes, as expected, female students reported more intimate levels of self-disclosure with peers, $t(330) = -6.15, p < .001$, and with mothers, $t(330) = -3.92, p < .001$, than did male students, but no significant differences appeared for disclosure to fathers, $t(330) = 1.18, p > .20$. Comparisons among the three disclosure indexes revealed that for female respondents, disclosure was more intimate with peers than with either their mother, $t(159) = 3.59, p < .001$, or their father, $t(159) = 10.93, p < .001$, and more intimate with mothers than with fathers, $t(159) = 8.03, p < .001$. For male respondents, disclosure was more intimate with peers than with either their mothers, $t(169) = 2.07, p < .05$, or their father, $t(169) = 2.64, p < .01$, but levels of disclosure with mother and father were virtually identical ($t < 1.00$).

Replication of the Original Model

The first step in our analysis strategy was an attempt to replicate, with the data from Year 2, the final model that emerged from the Year 1 investigation. If that model again proved to be a reasonably good representation of the relations among the measured variables, then confidence in the model would be strengthened. However, this was not an independent replication in the sense of having an entirely new sample of respondents. During the one year that elapsed between the two data collection points, those students who were seniors during Year 1 graduated, and a new class of freshmen entered the high school. Thus, approximately 75% of the Year 2 respondents (the freshmen, sophomores, and juniors of Year 1) had been in the original investigation.

Even though a truly independent replication was not possible with these data, a successful replication of the earlier findings was certainly not without value. The reason for this lies in the one-year lag between the two measurement points. This lag was long enough so that a finding of similar results at Years 1 and 2 would considerably strengthen our faith in the stability of the processes posited by the model.

In the original Franzoi and Davis (1985) investigation, the model that afforded the best fit with the observed covariance structure was one that included a direct path, for male subjects, from mother warmth to loneliness. For the sake of conservatism, the same path was not included for female subjects. As we stressed at that time, however, those results “do *not* indicate that paternal warmth is unimportant, or that females' loneliness is unaffected by parental warmth generally” (p. 779). For this reason, in our Year 2 baseline model we decided to include, for both male and female subjects, paths from mother warmth to loneliness and from father warmth to loneliness.

To test the adequacy of this model, we used a simultaneous group analysis in LISREL-VI. In this procedure, the program attempts to reproduce the observed covariance matrix for female and male subjects simultaneously, thus testing the notion that the same theoretical model accounts equally well for the data of male and female subjects. In this initial analysis all the estimated paths were constrained to be equal for each sex. The results are shown in Figure 2.

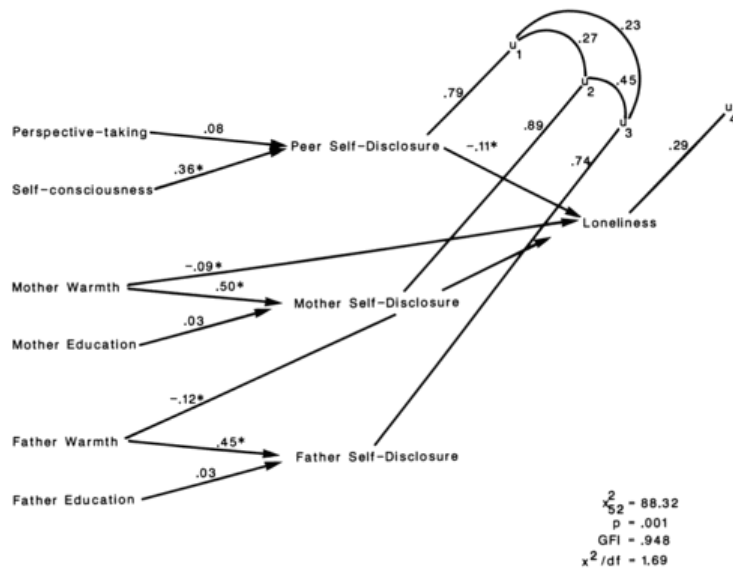


Figure 2. Replication of Year 1 model using Year 2 data: Baseline model

The overall fit of the model appeared to be reasonably good, $\chi^2(52, N = 334) = 88.32, p = .001$, with the ratio of the chi-square value to the degrees of freedom equaling 1.69. In addition to this measure of fitness, the LISREL-VI program provides a goodness-of-fit index (GFI), which is not sensitive to sample size. This index can take on values from zero to one, with higher values indicating a better fit. The GFI value for this model was .948, which indicated a good fit.

As important as the overall fit, however, are the path coefficients produced by the LISREL-VI program. Virtually all of the theoretically important paths were again significant for the Year 2 data. As in the Year 1 analyses, private self-consciousness was significantly associated with greater self-disclosure, which was in turn significantly and negatively related to loneliness. Again, as in Year 1, perspective taking was not significantly related to greater self-disclosure. Both maternal and paternal warmth were again significantly associated with disclosure to mothers and fathers, respectively. Moreover, as expected, both of the new paths—from parental warmth to loneliness—were negative in sign and statistically significant. Thus, the Year 2 data quite clearly supported the theoretical model that resulted from our initial investigation.

Our next step in the analysis of the Year 2 data was thus to test for sex differences, as we had done in the previous study. Accordingly, we compared the fit of the baseline model with an alternative model that allowed five paths to vary for male and female subjects: the two paths leading *to* and the one leading *from* peer disclosure as well as the direct paths from parental warmth to loneliness. The latter two paths were allowed to vary in case these relations differed for male and female respondents.

The results of this model appear in Figure 3. The first and most important finding was that the fit of this model was not appreciably better than the Year 2 baseline model, $\chi^2(47, N = 334) = 81.80, p = .001$. The chi-square/degree of freedom (χ^2/df) ratio was 1.74, only minutely better than the 1.69 value of the baseline model; the GFI for this model (.951) was likewise barely higher than that of the baseline model (.948). As these comparisons suggest, the test for difference in chi-square revealed a nonsignificant difference, $\chi^2(5, N = 334) =$

6.5, *ns*. In fact, the only support at all for our hypothesized sex differences lay in the fact that the path from peer disclosure to loneliness was, as it was in Year 1, significant for female but not for male subjects. However, in the face of the GFI measures, the only appropriate conclusion was that again no reliable evidence had been found to support the sex differences hypothesis. On the basis of these conclusions, the remaining analyses combined male and female data.

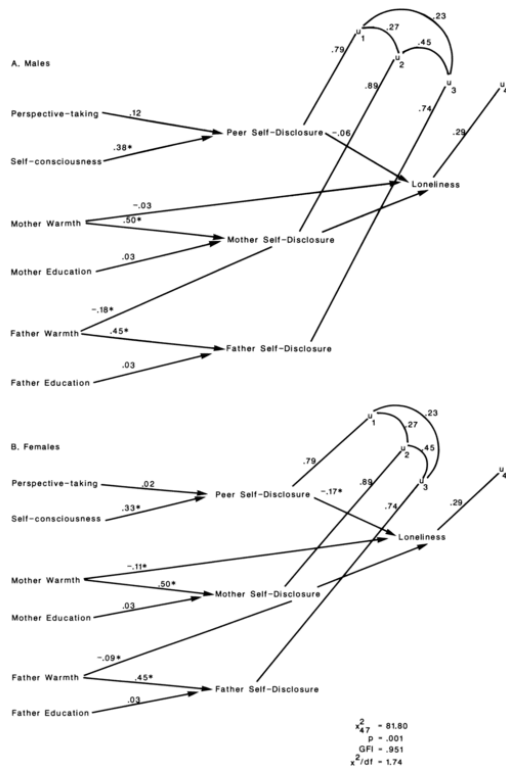


Figure 3. Replication of Year 1 model using Year 2 data: Paths for male and female subjects allowed to vary

Testing the Alternative Causal Hypotheses

The next step in our analysis was to prepare a covariance matrix that would allow us to examine the two alternative causal hypotheses using both of the strategies outlined earlier. These two strategies, remember, are the longitudinal approach, which estimates paths across years, and the cross-sectional approach, which estimates paths within years. Therefore, a set of respondents was identified from whom complete data had been collected at both data collection points. This sample consisted of 185 students (94 female and 91 male), all of whom had been freshmen, sophomores, or juniors at Year 1.

A decision was made at this point to eliminate some of the variables from our previous model before formulating and testing the longitudinal models. As the ultimate variable of interest was loneliness, the only variables retained for the remaining analyses were (a) loneliness itself and (b) all other variables which, on the basis of previous analyses, had direct (i.e., peer disclosure, mother warmth, father warmth) or indirect (i.e., self-consciousness) effects on loneliness.

The analysis strategy for the remainder of this article is the same as that used in the earlier Franzoi and Davis (1985) investigation. A baseline model was formulated and tested using the LISREL-VI program, and the fit of this model was compared with that of alternative models based on different causal assumptions. This longitudinal

baseline model appears in Figure 4. The 5 variables retained for analysis were all represented at both Year 1 and Year 2, for a total of 10 variables. At any one time point, paths were thus estimated from self-consciousness to disclosure and from disclosure, mother warmth, and father warmth to loneliness. In addition, paths were estimated from each of the 5 variables at Year 1 to their counterpart at Year 2, making a total of 13 paths to be estimated. These results appear in Figure 5.

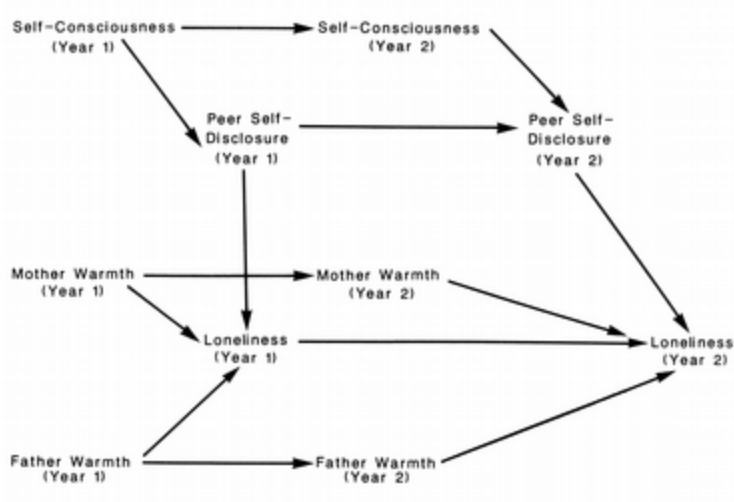


Figure 4. Hypothesized longitudinal model with reduced number of variables

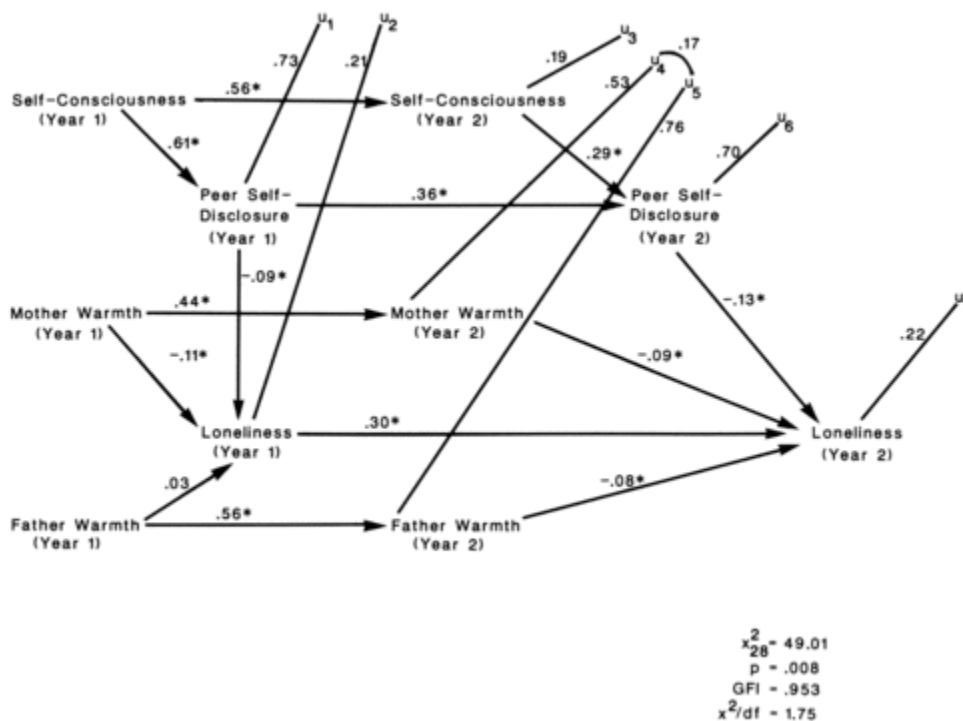


Figure 5. Longitudinal baseline model

The fit of this longitudinal baseline model was reasonably good, $\chi^2(28, N = 185) = 49.01, p = .008; \chi^2/df = 1.75$; GFI = .953. The chi-square/degree of freedom ratio was roughly equivalent to the Year 2 models described

earlier, as was the GFI value. The size and sign of all the estimated paths were as expected on the basis of the analyses conducted earlier. One exception to this pattern was that the path from private self-consciousness to self-disclosure, at Year 1, was noticeably stronger than it was in the original study. Apparently, the elimination in these analyses of roughly 25% of the original sample (i.e., the Year 1 seniors) resulted in this much stronger self-consciousness-disclosure link. The other paths in this model that were not estimated before included five paths between comparable variables at Year 1 and Year 2. It is interesting to note that of the three variables for which subjects reported their *own* behavior or feelings (private self-consciousness, self-disclosure, and loneliness), the personality variable of private self-consciousness exhibited the greatest stability (.56) from Year 1 to Year 2. The other two variables, which did not tap personality characteristics, showed significant but less sizable stability over time: peer disclosure (.29) and loneliness (.29).

Cross-Year Models

Our first model to test alternative causal paths used the longitudinal approach, which estimated paths—across years—in the opposite direction as before. Thus, two paths were added to the longitudinal baseline model: from self-disclosure (Year 1) to self-consciousness (Year 2) and from loneliness (Year 1) to self-disclosure (Year 2). An inherent assumption in this model was that the actual effect of disclosure on self-consciousness or loneliness on self-disclosure was not instantaneous but, instead, involved some passage of time that was relatively close to the one-year measurement lag. The results of this model appear in Figure 6.

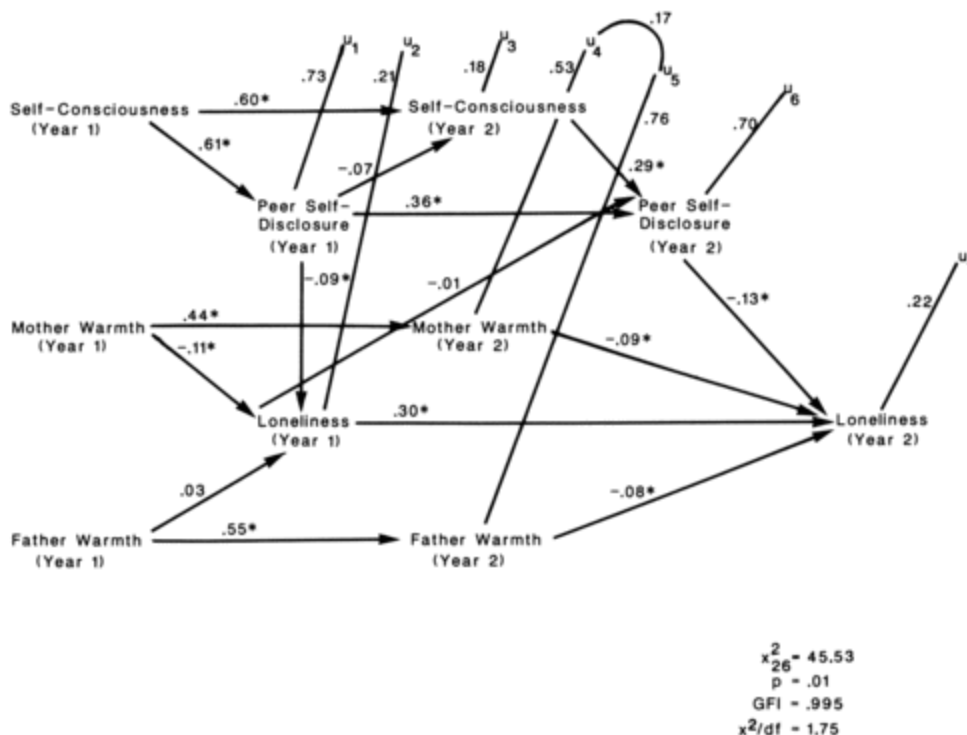


Figure 6. Model that tests alternative hypotheses using cross-year paths

Two important features of this model should be stressed. First, the fit of this model, $\chi^2(26, N = 185) = 45.53$, $p = .01$, $\chi^2/df = 1.75$, GFI = .955, was no better than that of the baseline model; the test for chi-square differences revealed no significant difference, $\chi^2(2, N = 185) = 3.48$, *ns*. Second, neither one of the new Year 1–Year 2 paths achieved conventional levels of significance. The path from Year 1 disclosure to Year 2 self-consciousness

approached significance but fell short; moreover, the sign of this path was the opposite of that predicted. Thus, no support for the alternative interpretations advanced earlier could be found in this analysis.

Before rejecting the alternative interpretations, however, another possibility had to be considered. It was possible that the alternative causal interpretations were correct but that the measurement lag was too long. It might therefore, have been unfair to reject these alternative hypotheses solely on the basis of the results of this model; perhaps the inappropriate measurement lag would prevent any cross-year paths (other than reliability paths between the same variable at two points in time) from achieving significance. One way to evaluate this possibility, we decided, was to test a model in which the original causal paths (from self-consciousness to disclosure and from disclosure to loneliness) were tested from Year 1 to Year 2. Because these paths had proved to be significant when estimated within one measurement point, we had some confidence in them. If they failed to emerge when estimated from Year 1 to Year 2, the appropriateness of the one-year measurement lag could be questioned. Accordingly, a separate model was tested in which two paths were added to the longitudinal baseline model: from Year 1 self-consciousness to Year 2 disclosure and from Year 1 disclosure to Year 2 loneliness. This model appears in Figure 7.

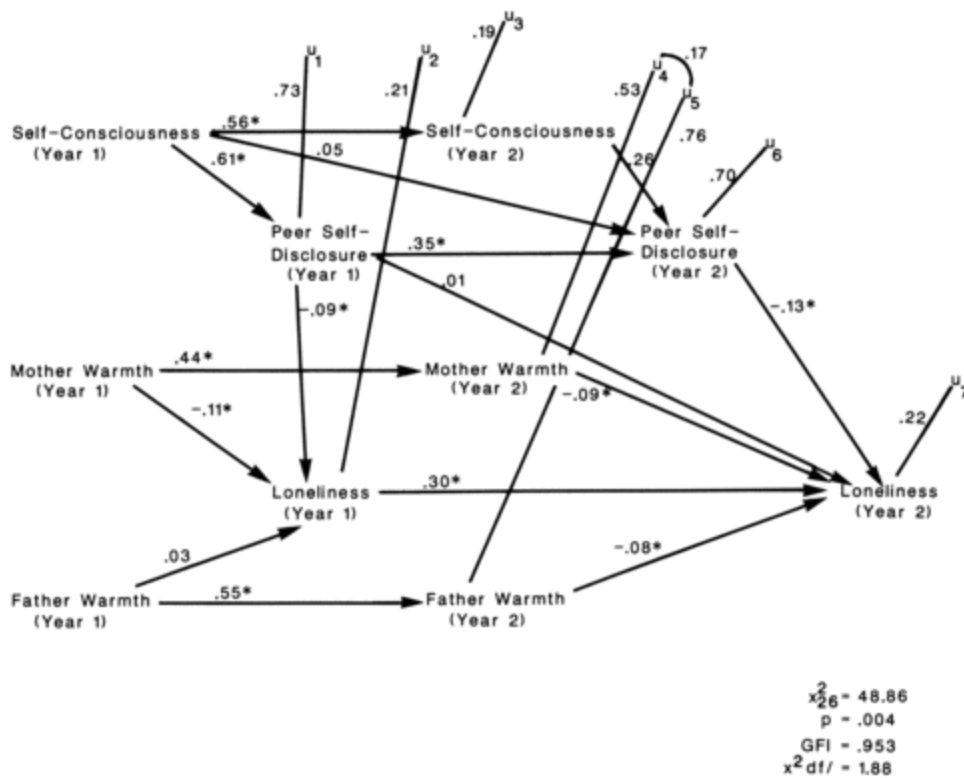


Figure 7. Model that tests original hypotheses using cross-year paths

Again, the alternative model failed to provide any significant improvement in fit over the baseline model, $\chi^2(2, N = 185) = .15, ns$. Neither of the new paths attained nor did they even approach significance. Thus, the theoretical paths that consistently emerged when estimated within one measurement period failed to emerge when estimated across years. These findings, therefore, strongly suggested that the actual causal lag among these variables was considerably shorter than the one-year measurement lag. They also suggested that the most appropriate means by which to evaluate the alternative causal interpretations of the original model was by

assuming an instantaneous causal lag and by estimating alternative causal paths within a single measurement period.

Within-Year Models

The next step in the analysis was to test a model that was identical to the longitudinal baseline model, with three exceptions: In both Year 1 and Year 2, paths were estimated from loneliness to self-disclosure instead of vice versa, and at Year 2 a path was estimated from self-disclosure to self-consciousness instead of vice versa. Thus, the alternative paths, representing a different view of causality, were here estimated within years instead of longitudinally. Contrary to the implicit assumption of the cross-year models, this model assumed an instantaneous lag. The results of this analysis appear in Figure 8.

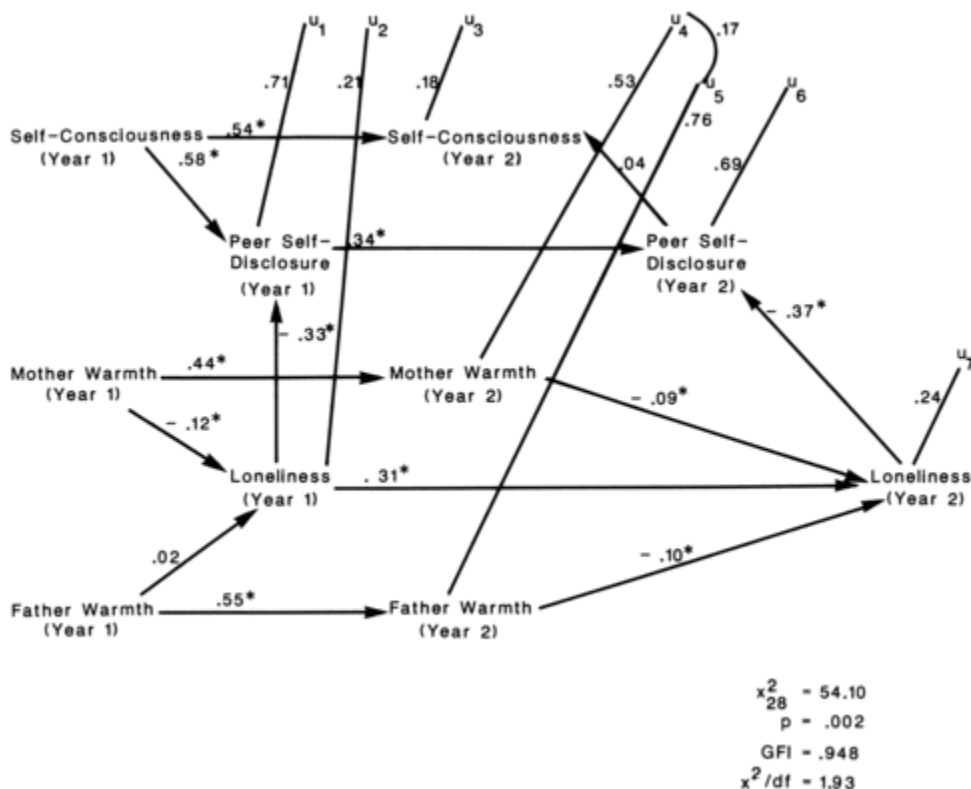


Figure 8. Model that tests alternative hypotheses using within-year paths

By every available measure, this model appeared to provide a poorer fit than the baseline model. The chi-square value, with 28 degrees of freedom, was 54.10 ($p = .002$), and the GFI for the model was .948. The chi-square-degree of freedom ratio was 1.93. Because neither of these two models were nested within the other, it was not possible to statistically compare them. However, although no statistical comparison was possible, it was clear that the alternative model was not superior to the baseline model. The question remained, however, why was this so? Upon inspection it appeared that the two alternative loneliness to self-disclosure paths worked well; both were statistically significant paths, comparable in size to the original, reversed causal paths of the baseline model. The biggest difference between the baseline model and this one was the self-disclosure to self-consciousness path at Year 2; the size of this path dropped to near zero, in striking contrast to the self-consciousness to disclosure path in the baseline model. This suggested the possibility that the causal assumption underlying this path was the most questionable one in the model, thus contributing to the relatively poor fit.

With regard to the paths linking self-disclosure and loneliness, however, *either* causal assumption—that of the baseline model or the alternative model—resulted in a significant association between the variables. One possible implication of this pattern is that there is a reciprocal causal relation between self-disclosure and loneliness (i.e., that reduced disclosure heightens loneliness and that loneliness reduces self-disclosure). Accordingly, one final model was formulated and tested in which reciprocal causal paths were estimated between disclosure and loneliness at both years and between self-consciousness and disclosure at Year 2. Thus, this model examined the possibility that both sets of causal assumptions were correct. These results appear in Figure 9.

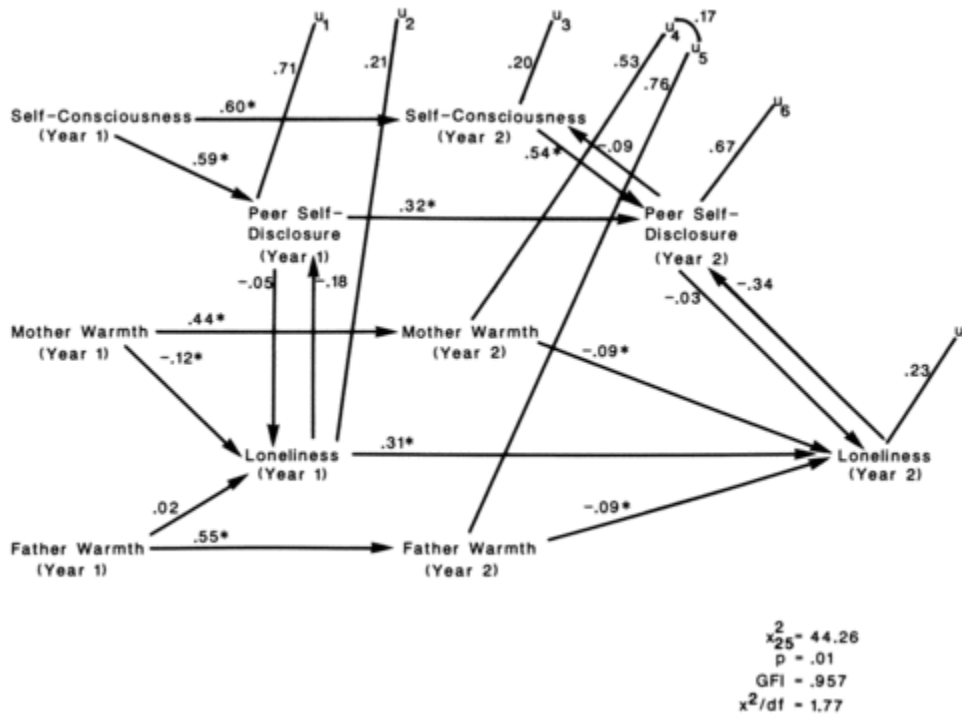


Figure 9. Model that tests reciprocal paths hypotheses using within-year paths

The fit of this model, as was the case with all the other alternative models, was not a significant improvement over the baseline model, $\chi^2(25, N = 185) = 44.26$, $p = .01$, $\chi^2/df = 1.77$, GFI = .957. Because the baseline model was nested within this alternative model the fit of the two could be directly compared, and the difference in fit was found to be nonsignificant, $\chi^2(3, N = 185) = 4.75$, *ns*. However, two interesting features of this model should be emphasized. First, when reciprocal paths were estimated between self-consciousness and disclosure (as they were at Year 2), the results were clearly consistent with our original causal assumptions. The path from self-consciousness to disclosure remained strongly significant, whereas the reverse path failed to achieve significance, as it did in the previous model. Second, when reciprocal paths were estimated between self-disclosure and loneliness, neither of the paths at either year were significant. Thus, paths based on either causal assumption, when tested without the other, were significant in the predicted direction. When both were estimated, however, neither one was significant. These are intriguing results and will be discussed in more detail later.

Discussion

The present study helps clarify our understanding of the causal relations among the personality characteristic of private self-consciousness, intimacy of disclosure to peers, and feelings of loneliness. Specifically, this research helps our understanding in four major ways. First, the collection of data one year after the initial investigation provided good evidence for the temporal stability of these relations. Second, these data made possible analyses that suggested answers to some of the questions of causality that were at the heart of this project. Third, the analyses suggested a relatively short causal lag time between variables rather than considerably longer lag times. Fourth, these data suggested some ways in which peer relationships and parental relationships differ in their influence on subjective loneliness.

One reasonable question that remained following the original Franzoi and Davis (1985) study concerned the reliability of the results. Quite simply, were the observed relations among the variables accurate, stable indicators of the true relations? The replication of the Year 1 model with the Year 2 data provided substantial evidence that such was the case. This replication resulted in estimated causal paths that closely mirrored the results from the original study. Thus, the original Franzoi and Davis results appear now to be a relatively stable phenomenon, or at least not a random set of responses that by chance happened to match a theoretical model. Thus, the evidence tends to support the conclusion that, despite the fluctuations that occur in social behavior and self-related feelings and behavior during adolescence, the relations among the variables have a considerable degree of stability.

Second, these results begin to provide some answers concerning the causal relations among these important personality and social variables. In particular, there are two causal links about which questions exist: the private self-consciousness-self-disclosure link and the self-disclosure-loneliness link. The evidence from this study strongly suggests that in the first case the causal relation is as we earlier assumed: Individual differences in the level of private self-consciousness result in differences in self-disclosure tendencies. At no time in these analyses did a statistically significant path emerge from self-disclosure to private self-consciousness. Thus, the conclusion suggested by these results is that, among adolescents in the United States, a habitual focus of attention on private self-aspects tends to increase the intimacy of disclosure to peers; however, such intimate disclosure has no reciprocal effect on one's tendency to focus on private, nonvisible self-aspects. On the basis of these results, it might be argued that the personality characteristic of private self-consciousness is relatively impervious to change by this time in life. Examination of the stability coefficients for private self-consciousness reveals a considerable degree of stability (.56), which suggests that this characteristic may be unaffected by much of what happens during one adolescent year. However, a coefficient of .56 reflects far from perfect stability, and at younger ages the amount of lability may be greater. Thus, although adolescents in the present study demonstrated no effect of disclosure on private self-consciousness, it would be premature to conclude that nothing affects this personality variable.

Another point to consider is that although intimate self-disclosure may not affect one's actual level of private self-consciousness, it might, nevertheless, influence other variables that are associated with greater self-consciousness. For example, one consistent correlate of private self-consciousness is more detailed and accurate self-knowledge (Franzoi, 1983; Turner, 1978). It is quite possible that one means by which private self-consciousness leads to such detailed knowledge is through self-disclosure (cf. Davis & Franzoi, in press). Disclosure to others about intimate thoughts and feelings, as well as the feedback from others that such disclosure invites, may be major contributors to a rich, detailed self-image. If, as Cooley (1922) suggested, our

self-image is a “looking glass” self constructed from the reflected appraisal of others, then the give and take that results from self-disclosure may be an especially potent source of self-knowledge. Thus, intimate self-disclosure may not make one more privately self-conscious, but it may help produce characteristics associated with greater self-consciousness. What these findings indicate is that self-disclosure per se does not directly influence the personality characteristic of private self-consciousness itself.

The evidence regarding the second causal question—the link between self-disclosure and loneliness—does not permit such a clear-cut conclusion. Instead, the pattern of results yields an ambiguous picture. When the more appropriate assumption of instantaneous causal lags is made, and the paths are accordingly estimated within years, neither causal assumption seems more appropriate than the other. That is, models based on opposite assumptions about causal direction (disclosure leads to loneliness vs. loneliness leads to disclosure) seem to do roughly equivalent jobs of reproducing the actual covariance matrix. Regardless of the causal assumption, the estimated paths are statistically significant, providing no clue as to which is the more appropriate model. Moreover, when a third model is tested, in which reciprocal paths are estimated between these variables, both paths are reduced in size, and both become statistically nonsignificant.

It is difficult to provide a completely satisfying explanation for this pattern. However, the most likely explanation for this phenomenon is multi-colinearity—the fact that the correlation between the two estimated parameters (the reciprocal causal paths) is so high that any attempt to estimate them both results in neither one being significant. Indeed, an examination of the correlations among parameter estimates, provided by the LISREL-VI program, reveals very high correlations ($r_s = -.919$ at Year 1 and $-.802$ at Year 2) between the parameters that correspond to the two reciprocal paths. Unfortunately, in these analyses there is little that can be done about such a problem. The high correlations between these parameters are simply a feature of this data set. Moreover, magnifying this difficulty is the relatively small size of the sample; although it is not certain by any means, it is altogether possible that were this same pattern to be found in a larger investigation involving several hundred respondents (instead of 185), the reduced error variance in the larger sample might allow a “teasing apart” of these two effects. In short, however, it appears at this time that the precise nature of these causal relations cannot yet be successfully separated using the current data set.

The third important finding of this investigation, however, may suggest another means by which to disentangle the relation between peer self-disclosure and loneliness: through the use of more appropriate time lags. On the basis of a comparison of the within-year and cross-year models, it appears that the personality variable of private self-consciousness affects willingness to self-disclose over relatively shorter rather than longer time-spans. Likewise, the effect that peer self-disclosure has on loneliness and/or the effect that loneliness has on disclosure appears to be over more quickly than slowly. One promising avenue to be explored in the future would be to use longitudinal designs with shorter measurement lags. It may be possible to better answer the causal question between disclosure and loneliness if lags of days or weeks—rather than 12 months—are used. In the absence of such evidence, however, the question of causality between self-disclosure and loneliness must be left open.

A final point that should not be overlooked concerns the finding here that parental warmth exerts a generally consistent and direct, albeit modest, influence on loneliness for both male and female adolescents. Previous research in this area (Goswick & Jones, 1982; Solano et al., 1982) has suggested that disclosure to parents is relatively unimportant in affecting loneliness, at least when compared with the effects of peer disclosure. Our

results are consistent with this point of view, but they further suggest that parents are not totally unimportant to the adolescent's subjective feelings of loneliness. Instead, the affective tone of the adolescent's relationship with parents, not disclosure per se, is seen to have a small but reliable influence on reported loneliness; not surprisingly, warmer and more loving relationships with parents lead to reduced feelings of social isolation. The importance of this finding lies not simply in the fact that parents can make a child feel less lonely but in its suggestion that adolescent loneliness is ameliorated by a congenial and supportive family atmosphere and not directly through self-disclosure to parents. Thus, although disclosure to peers is especially important in affecting loneliness, other aspects of parental relationships seem more crucial to these subjective feelings of alienation.

Footnotes

- ¹ To illustrate this problem, imagine two variables: (a) eating or not eating green apples and (b) becoming or not becoming sick. There is a clear causal effect of the former on the latter; however, if the measurement lag between the two events is too short (30 s) or too long (6 months), there will erroneously appear to be no connection between the two. Thus, despite its considerable strengths, a longitudinal design is not invariably the best way to investigate all questions of causality.
- ² The decision to use a one-year measurement lag in this investigation instead of a shorter and perhaps more appropriate lag was unavoidable. The logistics of administering the lengthy survey instrument used in this research, coupled with the administrative needs of the school itself, determined that no shorter measurement interval was feasible.
- ³ Franzoi and Davis (1985) administered the 10-item SDI and the shortened index to 134 college students (60 male and 74 female) and found that they were highly correlated ($r = .94$ for men; $r = .89$ for women). These findings indicate that the shortened SDI is an adequate substitute for the longer version.
- ⁴ The covariance matrices used in this and all subsequent analyses are available from Mark H. Davis on request.
- ⁵ Although the probability level associated with this chi-square value was less than .05, a number of methodologists (Bentler & Bonnett, 1980; Burt, 1973; Jöreskog, 1969) have cautioned against a literal interpretation of the chi-square from this statistic owing to its sensitivity to sample size. Instead, goodness of fit between the covariance matrix produced using theoretical specifications and the actual observed covariances is often assessed by examining the ratio of the chi-square value to the degrees of freedom for that model (Alwin & Jackson, 1980, Bohrnstedt, 1983). The closer this ratio is to unity, the better the fit of the model to the data.
- ⁶ Ideally, a *reversed* path would also have been estimated from disclosure to self-consciousness at Year 1 as well. However, in these models, Year 1 self-consciousness is an exogenous variable, which by definition cannot be connected to a causal path that leads into it.

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